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lines. Some of them are given by ROWLAND as due, at least in part, to other elements in the Sun. If these chromium lines are really present in the Sun, it would mean that the conditions of the solar atmosphere are capable of sharpening lines in a way accomplished in the laboratory by a vacuum source.

The arc between iron terminals in vacuum presents some interesting features. A pink glow surrounds the point on the positive pole from which the arc proceeds. Towards the negative pole the vapor is bluish green, with an absence of the yellow envelope given by iron oxide when the arc burns in air. This negative glow gives the iron arc lines strongly, while the discharge at the positive pole is especially effective in giving the spectra of hydrogen and nitrogen, probably supplied by the residue of air in the chamber. The reddish glow is due to a high intensity of $H\alpha$. Bathed plates covering the region from λ 5000 to λ 6700 show $H\alpha$ several times as strong as the brightest iron line in this range, which includes the brilliant arc lines of the green-yellow, a region to which the plate is more sensitive than to $H\alpha$. The line $H\beta$, which appears on other plates, is faint relatively to neighboring iron lines, the vacuum arc appearing to give a strong intensity gradient between the two members of the hydrogen series. At the negative pole, $H\alpha$ may be detected, but is very faint.

In the violet and blue, the spectrum given near the positive pole of the iron arc is dominated by the nitrogen bands belonging to the second positive group of DESLANDRES. A similar phenomenon was noted by HAGENBACH for the copper arc in vacuum. The bands are strong and the dispersion employed gives a good resolution of the component lines. The weakness of the iron lines at the positive pole is very pronounced, the exposure time required for these being about fifty times as great as at the negative pole.

ARTHUR S. KING.

MT. WILSON SOLAR OBSERVATORY, September 16, 1914.

NOTE ON THE SYSTEM OF EPSILON HYDRÆ.

The object of this note is to call the attention of astronomers interested in measures of radial velocity to the fact that the stars A and B in the system of ϵ *Hydræ* are now approaching

the line of nodes. According to my elements,¹ the star B will pass the ascending node in April, 1915. Since the date of periastron is 1916.27, only a year later, the orbital velocity is now very rapid and the companion will traverse 180° of true anomaly and reach the descending node by April, 1917.

It follows that a series of spectrographic measures beginning at the present time and extending over the next three years will give both the maximum and the minimum radial velocity of the brighter star A, and be of the greatest service in correcting the orbit elements.

ϵ *Hydræ*, it will be remembered, is at present the only binary system whose elements can be determined both by micrometer measures and by measures of radial velocity. Measures which I secured on two nights with the 36-inch telescope gave the position: 1914.26 $265^\circ.4$, $0''.20$, in good agreement with that predicted by my orbit. The angular distance is diminishing rapidly and will reach the minimum of about $0''.08$ early in 1916. It will hardly be possible to secure reliable micrometer measures after April, 1915, until the companion is near the descending node in 1917. This fact adds to the importance of securing good measures of the radial velocity in that interval.

R. G. AITKEN.

September, 1914.

THE BRIGHT-LINE STAR A. G. C. 22748.
($\alpha = 16^h 44^m.5$; $\delta = -41^\circ 4'.$)

This star was discovered to have bright lines in its spectrum by Mrs. FLEMING in 1889 from the study of the Harvard College Observatory objective-prism plates taken at Arequipa, Peru. When the designation "fifth type" was suggested by PICKERING in 1891 for the thirty-three bright-line stars then known, he placed this star in the second of three divisions, differing as to the widths and intensities of the lines, and remarked that the lines appeared to be *Orion* lines, bright instead of dark. The star is included in the list of Wolf-Rayet stars observed in 1894 by CAMPBELL, who noted the bright lines at 4690 Å and 4637 Å and the bright borders to H γ 4340 Å and H ϵ 4473 Å. In 1898 Harvard College Observatory re-

¹ See *Publications A. S. P.*, **24**, 216, 1912.